

CLAIMS

What is claimed is:

1. A system for loading an anastomosis connector assembly onto a graft vessel, the connector assembly comprising an inner frame and an outer frame, the outer frame having an original state and an expanded state, the system comprising:
an outer frame cartridge configured for releasably holding the outer frame in the expanded state for placement over the graft vessel; and
an inner frame cartridge configured for releasably holding the inner frame and for operatively engaging the inner frame within the graft vessel when the outer frame is in the expanded state.
2. The system of claim 1, further comprising a platform, wherein the outer frame cartridge comprises a mechanism for interlocking the outer frame cartridge to the platform.
3. The system of claim 2, wherein the platform further is configured to receive the inner frame cartridge in apposition to the outer frame cartridge and to translate the inner frame cartridge relative to the outer frame cartridge.
4. The system of claim 2, further comprising a gauge for indicating the distance translated by the inner frame cartridge.
5. The system of claim 1, wherein the inner frame cartridge comprises a handle and a shaft extending therefrom wherein the distal end of the shaft is configured for releasably holding the inner frame connector.
6. The system of claim 1, further comprising a mating cartridge configured for releasable engagement with the outer frame and the inner frame upon operative engagement between the outer and inner frames.

7. The system of claim 6, wherein the mating cartridge is configured for engagement with a tool for deploying the interconnected connector assembly and graft at an anastomosis site.

8. The system of claim 6, wherein the mating cartridge is configured to engage with outer and inner frames having any suitable size.

9. A method for loading an anastomosis connector assembly onto a graft vessel, the connector assembly comprising an inner frame and an outer frame, the outer frame having an original state and an expanded state, the method comprising:

providing the outer frame releasably engaged to an outer frame cartridge wherein the outer frame is provided in the expanded state;

positioning at least a portion of the outer frame about the outside of the graft vessel;

providing the inner frame releasably engaged to an inner frame cartridge;

appositioning the inner frame cartridge with the outer frame cartridge wherein at least a portion of the inner frame is positioned within the graft vessel; and

releasing the outer frame from the expanded state to the original state.

10. The method of claim 9, further comprising releasing the inner frame from the inner frame cartridge.

11. The method of claim 9 or 10, wherein the graft vessel is securely fixed between the outer frame and the inner frame.

12. The method of claim 9, wherein the releasing the outer frame comprises interconnecting the outer frame with the inner frame.

13. The method of claim 9, further comprising mounting the outer frame cartridge to a stable platform prior to appositioning the inner frame cartridge.

14. The method of claim 13, further comprising mounting the outer frame cartridge to the stable platform prior to appositioning the inner frame cartridge.

15. The method of claim 14, further comprising using a means on the stable platform to expand the outer frame member.

16. The method of claim 14, further comprising using a means on the stable platform to apposition the inner frame cartridge with the outer frame cartridge.

17. An instrument for deploying an anastomosis connector assembly at an anastomosis site, the connector assembly comprising interconnected deflectable inner and outer frames, the instrument comprising:

an outer frame deflector; and

an inner frame deflector;

wherein the deflectors are configured to hold the interconnected anastomotic connector assembly, the outer frame deflector is configured to engage and selectively deflect a portion of the outer frame, and the inner frame deflector is configured to engage and selectively deflect a portion of the inner frame; and

wherein actuation of the deflectors advances the deflectors towards each other to deflect the frames and subsequently release the frames wherein the interconnected connector is deployed as the anastomosis site.

18. The instrument of claim 17, wherein the outer frame deflector and the inner frame deflector are independently operable.

19. The instrument of claim 17, wherein the outer frame deflector and the inner frame deflector are simultaneously operable.

20. The instrument of claim 19, wherein the instrument is configured wherein movement of the outer frame deflector is offset from movement of the inner frame deflector.

21. The instrument of claim 20, wherein the inner frame deflector releases the inner frame prior to the outer frame deflector releasing the outer frame.

22. The instrument of claim 21, wherein the movement of the deflectors is a rotational movement and wherein the outer frame deflector commences rotating after the inner frame deflector has rotated an angle in the range from about 30° to about 90°.

23. The instrument of claim 21, wherein the instrument further comprises:
an elongated shaft having a longitudinal axis;
a handle mechanism at a proximal end of the elongated shaft; and
an end effector at a distal end of the elongated shaft and comprising the deflectors, wherein the deflectors are movable by the handle mechanism.

24. The instrument of claim 23, wherein the end effector is rotatable about the shaft longitudinal axis.

25. The instrument of claim 23, wherein the end effector is rotatable about an axis other than the shaft longitudinal axis.

26. The instrument of claim 24, wherein the end effector is rotatable about an axis transverse to the shaft longitudinal axis.

27. A system for implanting an anastomosis connector assembly at anastomotic site to interconnect a graft vessel with a host vessel, the connector assembly comprising interconnectable frames comprising an inner frame and an outer frame, the outer frame having an original state and an expanded state, the system comprising:

a loading apparatus comprising an outer frame cartridge configured for releasably holding the outer frame in the expanded state for placement over the graft vessel, and an inner frame cartridge configured for releasably holding the inner frame and for operatively engaging the inner frame within the graft vessel when the outer frame is in the expanded state; and

a deployment apparatus comprising an elongated shaft and an end effector at a distal end of the elongated shaft, the end effector comprising first and second rotatable deflectors to configured to engage with and remove the interconnected connector assembly from the loading apparatus.

28. The system of claim 27, further comprising a mating cartridge configured for engagement with the loading apparatus and the deployment tool wherein and for transferring the

29. The system of claim 28, wherein the mating cartridge is configured to engage with outer and inner frames having any suitable size.

30. The system of claim 27, further comprising a selection of outer and inner frames of varying sizes.

31. A method for implanting an anastomosis connector assembly at anastomotic site to interconnect a graft vessel with a host vessel, the connector assembly comprising interconnectable frames comprising a deflectable inner frame and a deflectable outer frame, the outer frame having an original state and an expanded state, the method comprising:

- expanding the outer frame into the expanded state;
- positioning at least a portion of the outer frame about the outside of the graft vessel;
- appositioning the inner frame with the outer frame wherein at least a portion of the inner frame is positioned within the graft vessel;
- releasing the outer frame from the expanded state to the original state wherein the outer frame is interconnected to the inner frame;
- deflecting the inner and outer frames;
- inserting at least a portion of the deflected inner and outer frames into the host vessel; and
- releasing the deflected inner and outer frames wherein the graft vessel is in fluid communication with the host vessel.

32. The method of claim 31 wherein the expanding, positioning, appositioning and first releasing steps comprise using the loading apparatus of claim D1.

33. The method of claim 32 wherein the deflecting, inserting and second releasing steps comprise using the deployment tool of claim D1.